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10/808,586	03/25/2004	Hiroyuki Arai	16359-005001 / 720/SM/toh	4600

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☒ All   b)☐ Some *   c)☐ None of:

       1.☒ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *May. 18, 2006; Nov. 09, 2004.*

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Drawings

1.   Figures 12-14 should be designated by a legend such as --Prior Art--

because only that which is old is illustrated. See MPEP § 608.02(g). Corrected

drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office

action to avoid abandonment of the application. The replacement sheet(s) should

be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so

as not to obstruct any portion of the drawing figures. If the changes are not

accepted by the examiner, the applicant will be notified and informed of any

required corrective action in the next Office action. The objection to the drawings

will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent

basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP

§ 608.01(o). Correction of the following is required: claims 5-7 recites the

limitation "data X" and "data Y". There is insufficient antecedent basis for this

limitation in the claim.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

3.   Claims 2, 4-7 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention.

In claims 2, 4-7, recites "TW", there isn't a clear definition for abbreviation

"TW".

In claims 5-7, recites "data X" and "data Y" which are not clear, what are

the composition of "data X" and "data Y"?

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims **1-15, 17-20** are rejected under 35 U.S.C. 102(b) as being

anticipated by Hoekstra (US Patent 6,005,538).

As to claim **1**, Hoekstra discloses a driving circuit (Fig. 3) for a vacuum

fluorescent display having a filament (Fig. 3(26)), a grid electrode Fig. 3(24)) and

a segment electrode (Fig. 3(20a-g)), the driving circuit comprising: a filament

driving unit (Fig. 3(50)) for driving the filament; a grid driving unit (Fig. 3(46)) for

pulse-driving the grid electrode; a segment driving unit (Fig. 3(42)) for pulse-

driving the segment electrode; and a controlling unit (Fig. 5(92)) for validating or

invalidating the output of the filament driving unit at a proper timing (Fig. 8).

As to claim **2**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 1, wherein in case of invalidating the output (Fig. 5

(60)) of the filament driving unit, the controlling unit invalidates (Col. 6 line 29,

microcomputer **removes** *the drive from transistor (Fig. 5(Q1)) which causes Q1*

to open) the output of the filament driving unit for a time period TW (Fig. 8(A))

when a voltage is reached at which the grid electrode and the segment electrode

are driven by the grid driving unit and the segment driving unit, respectively, and

when the time period TW to reach the voltage is shorter than a predetermined

time period (Col. 6 lines 19-59).

As to claim **3**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 2, wherein the controlling unit outputs (Fig. 5(44,48)) a

pulse driving signal for pulse-driving the filament (Col. 5 line 62-Col. 6 line18).

As to claim **4**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 2, wherein during the time period TW (Fig. 8(A))

shorter than the predetermined time period, the controlling unit fixes (Col. 6 line

36, ...***causing** the filament to **ride** at...*) the output of the filament driving unit at a

predetermined level (Fig. 5($-V_{kk}$), also see Col. 6 lines 31-34).

As to claim **5**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 2, wherein the driving circuit for a vacuum fluorescent

display enables the output of the filament driving unit to be set invalid when it is

at some logic value (Fig 5(48)), the driving circuit receiving from exterior data X

(Fig. 5(60)) that enables the output of the filament driving unit to be set valid

when it is at another logic value (OFF), and wherein the controlling unit (Fig.

5(92)): sets the output of the filament driving unit invalid for the time period TW

(Fig. 8(A)) that is shorter than the predetermined time period when the data X

(Fig 5(48)) received from the exterior is at the some logic value (on); and sets the

output of the filament driving unit valid when the data X received from the exterior

is at the other logic value (Col. 5 line 61-Col. 6 line 18).

As to claim **6**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 5, wherein the driving circuit for a vacuum fluorescent

display receives from an exterior data Y (Fig. 5(98)) correlated with the duty ratio

of the output of the grid driving unit or the output of the segment driving unit, and

wherein the time period TW is a time period of the pulse width based on the duty

ratio corresponding to the received data Y (Col. 6 lines 19-59).

As to claim **7**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 2, wherein the driving circuit for a vacuum fluorescent

display receives from exterior data Y (Fig. 5(98)) correlated with the duty ratio of

the output of the grid driving unit or the output of the segment driving unit, and

wherein the controlling unit (Fig. 5(92)) invalidates the output of the filament

driving unit for the time period TW when the time period TW based on the duty

ratio corresponding to the received data Y is equal to or shorter than a

predetermined time period (Col. 6 lines 19-59).

As to claim **8**, Hoekstra discloses a driving circuit for a vacuum fluorescent

display according to claim 2, wherein the driving circuit for a vacuum fluorescent

display is a semiconductor integrated circuit (Fig. 5(92)), the driving circuit

enabling a switching element (Fig. 5(Q1)) that generates a voltage (Fig. 8(5V))for

pulse-driving the filament to be connected to exterior based on the output (Fig.

5(44) of the filament driving unit (Col. 5 line 61-Col. 6 line 18).

As to claim **9**, Hoekstra discloses a driving circuit for a vacuum fluorescent display according to claim 2, comprising a switching element (Fig. 5(Q1)) that generates a voltage (Col. 6 line 6-14) for pulse-driving (Col. 6 line 20) the filament based on the output of the filament driving unit (Col. 5 line 61-Col. 6 line 18).

As to claim **10**, Hoekstra discloses a driving circuit for a vacuum fluorescent display according to claim 9, wherein the driving circuit for a vacuum fluorescent display is a semiconductor integrated circuit (Fig. 5(92), the driving circuit enabling the switching element (Fig. 5(Q1)) to be connected (Fig. 5(C2, R32)) to exterior.

As to claim **11**, Hoekstra discloses a driving circuit for a vacuum fluorescent display according to claim 9, wherein the driving circuit for a vacuum fluorescent display is a semiconductor integrated circuit integrated (Fig. 7(90) with the switching elements (Col. 7 lines 46-59).

As to claim **12**, Hoekstra discloses a driving circuit for a vacuum fluorescent display according to claim 1, wherein when validating the output (Fig. 3(60)) of the filament driving unit (Fig. 3(50)), the controlling unit enables a pulse width and/or a pulse cycle of a pulse (Col. 6 line 20) driving signal for pulse-driving the filament to be set based on data (Fig. 5(44) received from exterior.

As to claim **13**, Hoekstra discloses a driving circuit for a vacuum fluorescent display according to claim 12, wherein the data received from exterior includes pulse width data (Fig. 8(A)) for setting the pulse width of the pulse driving signal, and wherein the controlling unit generates the pulse (Col. 6 line

20) driving signal having a pulse width corresponding to the received pulse width

data (Col. 6 lines 19-59).

As to claim **14**, Hoekstra discloses a driving circuit for a vacuum

fluorescent display according to claim 12, wherein the data received from exterior

includes pulse cycle data (Fig. 8) for setting the pulse cycle of the pulse driving

signal, and wherein the controlling unit generates the pulse driving signal having

a pulse cycle corresponding to the received pulse cycle data (Col. 4 lines 13-51).

As to claim **15**, Hoekstra discloses a driving circuit for a vacuum

fluorescent display according to claim 12, wherein the data (Fig. 5(44) received

from exterior includes pulse width data (Fig. 8) for setting the pulse width (Fig.

8(A)) of the pulse driving signal and pulse cycle data (Fig. 5(60)) for setting the

pulse cycle of the pulse driving signal, and wherein the controlling unit sets the

pulse width and/or the pulse cycle of the pulse driving signal by putting the pulse

driving signal at one level (Col. 6 line 27, duty cycle does not exceed 50%...) for

a time period of the pulse width corresponding to the received pulse width data,

and by putting the pulse driving signal at another level (Col. 6 line 48, between

50-80%) for a time period other than the pulse width among the pulse cycles

corresponding to the received pulse cycle data (Col. 6 lines 19-59).

As to claim **17**, Hoekstra discloses a driving circuit for a vacuum

fluorescent display according to claim 12, wherein the driving circuit for a vacuum

fluorescent display is a semiconductor integrated circuit (Fig. 5(92), the driving

unit enabling the switching element (Fig. 5(Q1)) that generates a voltage (Fig.

8(5V)) for pulse-driving the filament based on the pulse driving signal (Fig.

5(R32,C2)) to be connected to the exterior (Fig. 5(92)).

As to claim **18**, Hoekstra discloses a driving circuit for a vacuum

fluorescent display according to claim 12, wherein the driving circuit for a vacuum

fluorescent display comprises a switching element (Fig. 5(Q1)) that generates a

voltage (Fig. 8(5V)) for pulse-driving the filament based on the pulse driving

signal (Fig. 5(R32,C2)).

Regarding claims **19,20**, limitations within these claims are identical to

claims **10, 11** respectively. Therefore, same rejections apply to these claims.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

7.   Claim **16** is rejected under 35 U.S.C. 103(a) as being unpatentable over

Hoekstra (US Patent 6,005,538) in view of Harris (US Patent 4,968,917).

As to claim **16**, Hoekstra discloses a driving circuit for a vacuum

fluorescent display according to claim 15 above.

However, Hoekstra does not teach a **first comparing unit** for comparing

the pulse width data with a count value based on a reference clock signal; a

second comparing unit for comparing the pulse cycle data with a count value

based on a reference clock signal; a **counting unit** for generating the count

value by dividing as predetermined the reference clock signal as well as resetting

the count value when the result of the comparison at the first comparing unit or

the second comparing unit shows coincidence; and a **controlling unit** for putting

the pulse driving signal at one level when the result of the comparison at the first

comparing unit shows coincidence, and for putting the pulse driving signal at the

other level when the result of the comparison at the second comparing unit

shows coincidence.

Harris discloses a dimmer controller for VFD wherein utilizes a dual

comparator (Fig. 1(35)), a controlling unit (Fig. 1(40)) which also function as a

count unit (Col. 4 lines 19-42).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to utilize dual comparator circuit of Harris into vacuum

fluorescent display driver of Hoekstra, because it would improve the usability of

control circuit and offer finer adjustment to the brightness level as suggested by

Harris (Col. 1 line 64- Col. 2 line 61).

Conclusion

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Yuk C. Chow whose telephone number is 571

270-1544. The examiner can normally be reached on 8-6 M-TH E.T..

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Amare Mengistu can be reached on 571 270-1550. The

fax phone number for the organization where this application or proceeding is

assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

yc

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